Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

PAPERS

IN

CHEMISTRY.

No. I.

NEUTRALIZING MAGNETISM.

The LARGE SILVER MEDAL was this session presented to Mr. J. H. ABRAHAM, of Sheffield, F.L.S. for his method of Neutralizing the Magnetism which often occurs in the Balance, and other Steel Parts of the Works of Watches. The following communication has been received from Mr. Abraham on the subject.

Holy Green House, Sheffield,
March, 29, 1826.

DEAR SIR,

KNOWING that the Society for the encouragement of Arts, Manufactures, and Commerce, is always willing to countenance any invention that may be of public utility, I feel pleasure in submitting a discovery in magnetism, which I have no doubt will be found to contribute to both individual and public advantage.

The discovery to which I allude is a method of neutralizing concentrated magnetism in the most minute parts of the steel work of time-keepers, as chronometers, &c. without the aid of heat.

I have been frequently solicited to communicate the discovery for individual advantage only, at a fair price; but as my chief object in all my researches is public good, I prefer communicating the invention to the Society for promoting Arts, Manufactures, &c. not doubting but that the testimony of their approbation will be in proportion to what they consider the value of the discovery to the public.

I flatter myself that the respectable accompanying testimonials will prove satisfactory as to the practibility and utility of the invention.

I am, Sir,
&c. &c. &c.
J. H. Abraham.

A. Aikin, Esq.
Secretary, &c. &c.

Sheffield, March 31, 1826.

It is, I believe, generally understood by those who have not made the science of magnetism a study, that the fluid is *communicated* to steel bars, and other articles capable of possessing permanent active magnetism, by induction, friction with magnetic bars, &c. &c.

In my opinion the very contrary is the fact. All ferruginous bodies possess the magnetic fluid in a latent or inactive state, in proportion to their purity; this fluid may be brought into action and concentrated by various means, as position, friction, percussion, attraction, galvanism, electricity, &c. I believe that attraction is the most general cause of the steel works in time-pieces becoming actively magnetical.

Valuable watches are frequently observed to keep very irregular time, from no visible cause, whilst the works remain in connexion; nor after they are separated, unless the steel works are tested, by plunging them into fine steel filings. From the minuteness and delicacy of those parts of a time-piece which are manufactured from steel, it has been considered by those watch-makers with whom I have conversed on the subject to be almost an impossibility to deprive them of active magnetism by any other means than that of heat.

When a balance or verge has been exposed to a sufficient heat to distribute the fluid, it becomes unfit for further use till hardened and polished, and even then it is frequently spoiled; therefore watch-makers prefer either returning the watch in its magnetic state, or supplying new apparatus, which generally incurs an expense of six or seven shillings in a common watch, and a greater sum in proportion to the value of the works. In attempting to ***distribute*** (or, according to the general term, ***take out***) the magnetism in any part of the steel works of a watch, with a ***very fine magnet***, by ***touching*** it in a contrary direction, or with a different polarity, it must be complete chance if the experiment succeed; since the power applied, and the delicacy of the ***touch***, must be in proportion to the activity of the magnetism, and the fineness of the part containing it; for wherever the *finest* magnet last touches any part of a balance, it will leave a small concentration of magnetic power.

With a series of fine and very delicate magnets I always failed in ***completely*** neutralizing the fluid by the touch. After spending much time without success, I was still determined to surmount the difficulty if possible. Upon studying the first cause of all my trouble and disappointment, I was led to believe that I very probably might destroy the effect by means similar to those which produced it, and in this I was not disappointed, for the experiment succeeded equal to my expectations. Time-pieces generally become actively magnetical without being brought into contact with the agent that concentrates the fluid; but, according to the laws of magnetism, a contrary polarity will always be found in the part rendered magnetical, to that of the magnet presented to it.

This proves that the fluid is put in motion and concentrated by *attraction;* present the contrary power in the agent (not in contact) to the same part of the machinery, and it will repel or re-distribute the fluid which was previously attracted, and if it be kept in that position the least period of time beyond that which is necessary to neutralize the fluid, it will give contrary polarity to the part subjected to the experiment.

For some time I found a little difficulty in performing the experiment satisfactorily, owing to the invisibility of the fluid; but I was relieved from this difficulty by dipping the apparatus to be experimented upon into fine steel filings, which rendered the situation of the active magnetism visible.

Upon presenting a fine magnet to the part clothed with filings, at the distance of from one inch to a quarter of an inch, according to the power to be neutralized, it will immediately be perceived whether the polarity of the magnet be of the same kind as that in the apparatus; if so, the filings will gradually fall from the part as the power becomes neutralized: when all the filings have fallen from the part submitted to experiment, dip it again into the filings, to prove whether it has acquired opposite polarity, by remaining too long in the vicinity of the magnet; if that be the case, present the contrary end of the magnet at a distance in proportion to the power to be diffused. Very little practice will enable any person to deprive any part of the steel apparatus belonging to the time-piece of active magnetism in two or three minutes. I can generally perform the experiment in one minute, however magnetical the balance or other part may be that is to be deprived of this concentrated power.

CERTIFICATES.

DEAR SIR, Sheffield, March 28, 1826.

Mr. J. H. Abraham called upon me this afternoon, and exhibited his new mode of neutralizing concentrated magnetism in the fine steel works of watches and other time-pieces. The experiment was repeated many times with complete success, so far as I could judge by the test of steel filings presented on the occasion. If the Society, of which your are Secretary, find it, on examination, as perfect for the purpose intended as it appears to me to be, I doubt not that they will deem the inventor worthy of a honourable testimonial of their respect for his ingenuity and talents, so well, and, I believe, usefully, applied.

I am, Sir,
&c. &c. &c.
J. MONTGOMERY.

A. Aikin, Esq.
Secretary, &c. &c.

16, High-street, Sheffield,
March 30, 1826.

Sir,

Upwards of four years ago, Mr. Ray, of this place, brought me his watch, complaining of its going badly, observing it had not kept time since he allowed a person to stop it by presenting a powerful magnet to it. On taking out the balance, I found it so strongly magnetical as to lift a common sewing needle. As the watch was a valuable one, I declined trying any means to rectify it, as the method I had taken with other watches, having the same fault, was attended with a deal of trouble, and a risk of breaking the balance, and not always successful. Therefore, the shortest way, I advised Mr. Ray to have a new balance put to his watch. Mr. Ray observed, he thought Mr. Abraham, perhaps, might rectify it. Mr. Abraham undertook it, and completely freed it from magnetic power, by a simple and expeditious method, and not attended with any risk or damage to the balance, which must be of great importance to watch-makers and others.

A. Aikin, Esq.
Secretary, &c. &c.

Samuel Snidall,
Watch-maker.

Sir,

Sheffield, March 31, 1826.

About two years ago, Mr. E. Barber, merchant, of Sheffield, applied to me to regulate his watch, which, he remarked, kept time very badly, although it had till lately gone very correctly. Upon examining the parts very minutely, I perceived that the cause was owing to the balance and verge having both become strongly magnetical.

Not being able to deprive the parts of their magnetism without the application of heat, by which means they are very liable to be injured, I recommended Mr. Barber to apply to Mr. Abraham, who, I had been informed, had taken the magnetism out of a balance that was very strongly magnetical, without the aid of heat, or using any method that in the least injured the parts submitted to the experiment. Mr. Abraham returned the verge and balance to me so completely free from magnetism, that they would not attract the least particle of fine steel filings, although, previous to the experiment, they lifted a strong needle.

I consider that the discovery of a method of depriving the steel works of time-keepers of magnetism, without applying heat, will be of great value to the trade, as from some cause new watches are often found to be magnetical before they have been worn.

I am, Sir,
&c. &c. &c.

A. Aikin, Esq.
Secretary, &c. &c.

JOSEPH BROWN,
Watch-maker.

SIR, Sheffield, March 31, 1826.

I feel pleasure in adding my testimony of the correctness of Mr. Brown's statement respecting the magnetical state of my watch. It has gone as regularly since that period (upwards of two years since) as it had done previous to its becoming magnetical.

I am, Sir.
&c. &c. &c.

A. Aikin, Esq.
Secretary, &c. &c.

ENOCH BARBER.